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EXAMINER	
RIDDLE, CHRISTINA A	

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2851	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/594,836	OKITA, SHINICHI	
	Examiner	**Art Unit**	
	Christina Riddle	2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☒ Claim(s) *1, 2, 12, 14, 16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *1/10/2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date *9/28/2006*.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Acknowledgement is made that the instant application is a national stage entry application PCT/JP05/05958 filed on 3/29/2005 which claims priority from JP 2004-105941 filed on 3/31/2004.

2. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on 3/31/2004. It is noted, however, that applicant has not filed a certified copy of the JP 2004-105941 application as required by 35 U.S.C. 119(b).

Specification

3. The abstract of the disclosure is objected to because the abstract should be limited to less than 150 words in length. Correction is required. See MPEP § 608.01(b).

4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

5. Claims 1, 2, 12, 14, and 16 are objected to because of the following informalities:

a. Claim 1, line 13, “are” should be changed to --area--.

b. Claim 1, line 15, “the processing error” should be changed to –a processing error--.

c. Claim 1, lines 27-28, “said reference computation results” should be changed to –said reference processing results--.

d. Claim 2, line 11, “further has a fifth step” should be changed to –a fifth step--.

e. Claim 2, line 11, “a comparison results” should be changed to –a comparison result--.

f. Claim 12, line 8, "calculate" should be changed to --calculates--.

g. Claim 14, line 3, "apparatus” should be changed to –said apparatus--.

h. Claim 16, line 2, “a random residual error component” should be changed to –said random residual error component--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 10, the limitation "using optimal alignment parameters determined by the method of determination of the alignment parameters according to the first aspect of the present invention" is vague and indefinite since it is unclear what the first aspect of the present invention is. For the purposes of examination, this limitation is being interpreted to mean that the alignment parameters are determined. Thus, claim 10 is rejected for being vague and indefinite.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 2, 4-8, and 10-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Ina et al. (US PGPub 2003/0071980, referred to Ina hereinafter).

Regarding claim 1, Ina discloses a method for determining alignment parameters for positioning each of a plurality of processing areas (AGA shot areas A-L, Fig. 12A) arrayed on an object (wafer 20, Fig. 6) with respect to a predetermined processing position (para. [0039], alignment parameters are determined), which method for determining the alignment parameters comprises

a first step of performing position measurement for any sample points (mark elements 32 in alignment marks 30 in sample shots A to L, Figs. 10A-B, 12A-B, and

paras. [0104]-[0105]) set in each processing area under predetermined alignment parameters (Fig. 2 and para. [0082], AGA involves alignment measurement of position measurement points on the wafer) through opto-electric detection (alignment unit 617 with CCD sensors 923 and 924 used to measure positions of alignment marks in X and Y directions, Figs. 6 and 9 and paras. [0075] and [0082]) and statistical processing based on measured positions and design positions of said sample points to obtain reference computation results (Fig. 2 and para. [0082], alignment detection and statistical processing is performed in step S205 for AGA alignment to obtain resulting measurements of the alignment of a wafer),

a second step of positioning and processing each processing area at said predetermined processing position based on said reference computation results (Fig. 2 and para. [0087], the wafer is aligned and exposed in step S220 based on alignment results obtained in step S205), then measuring the processing error of said processing area to obtain reference processing results (Fig. 2 and para. [0088], in step S225, the wafer is inspected by the alignment apparatus to obtain error due to processing),

a third step of changing at least part of said predetermined alignment parameters and performing position measurement of any sample points set in each processing areas and statistical processing based on the measured positions and design positions of said sample points to obtain comparative computation results (Fig. 2 and paras. [0084] and [0091], in steps S215 to S210, S230, S235, and S240, process parameters other than the parameters set in S205 are used to redo the AGA measurement and signal processing is performed in Step S235), and

a fourth step of calculating said processing error for each processing area, estimated when assuming said positioning and processing said processing area at said predetermined processing position based on said comparative computation results (Fig. 2 and para. [0096], included in steps S255, S260, and S265, when the parameter values are determined and revised to achieve optimum alignment), using said reference computation results (results from step S205), said comparative computation results (results from steps S215 and S235), and said reference processing results (Fig. 2 and para. [0096], in steps S255, S260, and S265, the host computer compares correlation information for a wafer based on alignment results, inspection results, and estimated data and determines whether the correlation exceeds a threshold).

Regarding claim 2, Ina discloses in said third step, changing the alignment parameters in a plurality of ways to obtain a plurality of comparative computation results (Fig. 2 and paras. [0084] and [0091], step S215, parameter values other than the set parameter values are used to measure AGA alignment and in step S235, the host computer changes the values of alignment parameters)

in said fourth step, converting said reference processing results based on the differences between said reference computation results and said comparative computation results to calculate a plurality of estimated processing errors (Fig. 2 and paras. [0095]-[0096], step S255, the results of inspection and the results of further measurement (from step S215) and estimation in step S235 are used to calculate errors), and

further has a fifth step of comparing the plurality of estimated processing errors calculated at said fourth step and said reference processing result to obtain a comparison results and determining said alignment parameters based on the comparison results (Fig. 2, step S255 and paras. [0095]-[0096], the processing errors determined from alignment errors from steps S205, S215, and S235, are used to evaluate alignment parameters used to achieve optimum alignment in step S260).

Regarding claim 4, Ina discloses in said third step, changing variable first alignment parameters of any sample point among said alignment parameters without requiring repeat opto-electric detection so as to calculate said comparative computation results (Fig. 2 and para. [0091], step S235, the host computer changes the values of alignment parameters).

Regarding claim 5, Ina discloses wherein said first alignment parameters include at least one of the combination used in sample points opto-electrically detected at said first step, the processing parameters of the signal waveforms obtained by the opto-electric detection at said first step, the statistical processing model used at the time of said statistical processing, and the amounts of correction to be added to the measurement positions of the sample points opto-electrically detected at said first step (Figs. 2, 11, 12A-C, para. [0091]-[0093], in step S235, the host computer changes the effective signal processing window width that limits the signal band used when processing signals, which is a processing parameter of the signal waveform).

Regarding claim 6, Ina discloses wherein in said third step, changing second alignment parameters, among said alignment parameters, requiring repeat opto-electric

detection of said sample points separate from the opto-electric detection at said first step so as to calculate said comparative computation results (Fig. 2 and para. [0084], step S215, parameter values other than the set parameter values are used to measure AGA alignment).

Regarding claim 7, Ina discloses wherein said second alignment parameters include at least the type, number, and layout of said sample points (AGA sample shot arrangement and alignment mark-related information is a parameter, Figs. 4 and 12A), illumination parameters for illuminating said sample points at the time of said opto-electric detection (Figs. 2 and 4, wafer magnification and lighting mode are parameters), the state of focus at the time of said opto-electric detection (Figs. 2 and 4, wafer rotation and shift are parameters impacting alignment condition), and the type of alignment sensor performing said opto-electric detection (Fig. 2, para. [0084], in step S215, the AGA measurements, including the type, number, and layout of sample points, as well as measuring wafer magnification, rotation and shift are measured when the parameters are set to different parameters than the set parameters in step S205).

Regarding claim 8, Ina discloses wherein said third step includes

a sixth step of using signal waveforms obtained by said opto-electric detection at said first step to change at least part of said predetermined alignment parameters and obtain a plurality of said comparative computation results (Figs. 2, 11, 12A-C, para. [0091]-[0093], in step S235, the host computer changes the effective signal processing window width that limits the signal band used when processing signals, which is a

processing parameter of the signal waveform for the alignment signals measured in step S205 and S215) and

a seventh step of comparing the plurality of comparative computation results obtained at said sixth step and said reference computation results and selecting candidates of said comparative computation results to be used in said fourth step based on said comparison results (Fig. 2 and para. [0096], in step 255 the host determines the correlation between AGA measurement and alignment results obtained by estimation and the alignment inspection results to compare parameter values).

Regarding claim 10, Ina discloses an exposure method for exposing and transferring patterns of a mask (reticule 10, Fig. 6) on a plurality of shot areas (AGA shot areas A-L, Fig. 12A) arrayed on a substrate (wafer 20, Fig. 6), wherein said exposure method performs position measurement for sample points set in each shot area serving as a processing area by opto-electric detection (Fig. 2 and para. [0082], alignment detection and statistical processing is performed in step S205 for AGA alignment to obtain resulting measurements of the alignment of a wafer) using optimal alignment parameters determined by the method of determination of the alignment parameters according to the first aspect of the present invention (as discussed in the 112 2nd paragraph rejection above, this limitation is being interpreted to mean that the alignment parameters are determined, Fig. 2, step S205, determined alignment parameters that are set for the job are used to perform AGA alignment) and statistical processing based on measured positions and design positions of said sample points (Fig. 2 and para. [0082], alignment detection and statistical processing is performed in

step S205 for AGA alignment to obtain resulting measurements of the alignment of a wafer), and successively positions said shot areas with respect to an exposure apparatus (exposure apparatus, Fig. 6) serving as said predetermined processing position and exposes each shot area based on the computation results (Fig. 2, step S220, the wafer is exposed using the AGA alignment from previous steps).

Note: In claim 11, the examiner notes that the limitations “a reference computation result fetching means for performing position measurement...to obtain reference computation results”, “a reference processing result fetching means for measuring the processing error…based on said reference computation results, "a comparative computation result fetching means for changing at least part of said predetermined alignment parameters…to obtain comparative computation results,” and “a processing error calculating means for calculating said processing error for said processing areas…based on said comparative computation results using said reference computation results, said comparative computation results, and said reference processing results” do not properly invoke USC 112, 6th paragraph due to the recited structures and acts further modifying the “means for” phrase.

Regarding claim 11, Ina discloses an apparatus (Fig. 6) for determining alignment parameters for positioning a plurality of processing areas (AGA shot areas A-L, Fig. 12A) arrayed on an object (wafer 20, Fig. 6) with respect to a predetermined processing position,

said apparatus for determining alignment parameters having

a reference computation result fetching means (alignment unit 617 with controller 640, Fig. 6) for performing position measurement for any sample points set in each said processing area (mark elements 32 in alignment marks 30 in sample shots A to L, Figs. 10A-B, 12A-B, and paras. [0140]-[0105]) under predetermined alignment parameters via opto-electric detection (alignment unit 617 with CCD sensors 923 and 924 used to measure positions of alignment marks in X and Y directions, Figs. 6 and 9 and paras. [0075] and [0082]) and statistical processing based on measured positions and design positions of said sample points to obtain reference computation results (Fig. 2 and para. [0082], alignment detection and statistical processing is performed in step S205 for AGA alignment to obtain resulting measurements of the alignment of a wafer),

a reference processing result fetching means (alignment inspection apparatus 3 with host computer 4, Figs. 1 and 6) for measuring the processing error for each processing area to obtain reference processing results (Fig. 2 and para. [0087], the wafer is aligned and exposed in step S220 based on alignment results obtained in step S205) after positioning and processing said processing area at said predetermined processing position based on said reference computation results (Fig. 2 and para. [0088], in step S225, the wafer is inspected by the alignment apparatus to obtain error due to processing),

a comparative computation result fetching means alignment unit 617 with CCD sensors 923 and 924 used to measure positions of alignment marks in X and Y directions, Figs. 6 and 9 and paras. [0075] and [0082] or host computer 4, Figs. 1, 2, and 6) for changing at least part of said predetermined alignment parameters and

performing position measurement of any sample points set for each said processing area and statistical processing based on measured positions and design positions of said sample points to obtain comparative computation results (Figs. 1, 2, and 6 and paras. [0084] and [0091], in steps S215 to S210, S230, S235, and S240, process parameters other than the parameters set in S205 are used to redo the AGA measurement using the alignment inspection apparatus 3 and signal processing is performed in Step S235 via the host computer 4 to determine different computation results), and

a processing error calculating means (host computer 4, Figs. 1, 2, and 6) for calculating said processing error for said processing areas estimated when assuming positioning and processing said processing areas at said predetermined processing position based on said comparative computation results using said reference computation results, said comparative computation results, and said reference processing results (Fig. 2 and para. [0096], in steps S255, S260, and S265, the host computer 4 compares correlation information for a wafer based on alignment results, inspection results, and estimated data and determines whether the correlation exceeds a threshold).

Regarding claim 12, Ina discloses wherein said comparative computation result fetching means changes said alignment parameters in a plurality of ways to obtain a plurality of said comparative computation results (Fig. 2 and paras. [0084] and [0091], step S215, parameter values other than the set parameter values are used to measure

AGA alignment with alignment unit 617 and in step S235, the host computer 4 changes the values of alignment parameters),

said processing error calculating means converts said reference processing results and calculate said estimated processing error based on the differences between said reference computation results and said comparative computation results (Fig. 2 and paras. [0095]-[0096], in step S255, the host computer 4 uses the results of inspection and the results of further measurement (from step S215) and estimation in step S235 to calculate errors), and

provision is further made of a parameter determining means (host computer 4, Figs. 1, 2, and 6) for comparing the plurality of estimated processing error calculated by said processing error calculating means and said reference processing result and determining said alignment parameters based on the comparison results (Fig. 2, step S255 and paras. [0095]-[0096], the processing errors determined from alignment errors from steps S205, S215, and S235, are used to evaluate alignment parameters used to achieve optimum alignment in step S260).

Regarding claim 13, Ina discloses an exposure apparatus (exposure apparatus 1, Fig. 6) for transferring by exposure patterns of a mask (reticule 10, Fig. 6) on a plurality of shot areas (AGA shot areas A-L, Fig. 12A) arrayed on a substrate (wafer 20, Fig. 6),

said exposure apparatus provided with the apparatus for determining alignment parameters according to claim 12 (see claim 12 rejection above),

performing position measurement for any sample points set for each shot area serving as a processing area by opto-electric detection (Fig. 2 and para. [0082], alignment detection and statistical processing is performed in step S205 for AGA alignment to obtain resulting measurements of the alignment of a wafer) using optimal alignment parameters determined by the apparatus for determination of the alignment parameters and statistical processing based on measured positions and design positions of said sample points (Fig. 2, step S260 and para. [0096], optimum alignment parameters are set using the steps of aligning using alignment unit 617 and the host computer 4 as described in rejections of claims above), and successively positioning said shot areas with respect to said exposure apparatus serving as said predetermined processing position and exposing each shot area based on the obtained computation results (Fig. 2, further alignment and exposure occurs in step S220 to complete lot processing using the optimum alignment parameters).

Regarding claim 14, Ina discloses wherein said apparatus uses as an object a device production substrate (wafer 20, Fig. 6) to which device patterns formed on said mask transferred by exposure (Fig. 6 and para. [0067], an exposure apparatus 1 exposes a pattern on a reticle 10 onto a wafer 20),

said comparative computation result fetching means performs said position measurement and statistical processing for said device production substrate while changing said alignment parameters in a plurality of ways to obtain a plurality of said comparative computation results (Figs. 2, 11, 12A-C, para. [0091]-[0093], in step S235, the host computer 4 changes the effective signal processing window width that limits the

signal band used when processing signals, which is a processing parameter of the signal waveform for the alignment signals measured in step S205 and S215), and

said apparatus for determining alignment parameters compares said plurality of comparative computation results and said reference computation results and determines said alignment parameters based on said comparison results (Fig. 2 and para. [0096], in step 255 the host determines the correlation between AGA measurement and alignment results obtained by estimation and the alignment inspection results to compare parameter values).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ina in view of Matsumoto et al. (US PGPub 2004/0058540, referred to as Matsumoto hereinafter).

Regarding claim 3, Ina discloses, in said fifth step, determining the optimal alignment parameters based on the processing error for each processing area according to said reference processing result or said estimated processing error (Fig. 2, step S255 and paras. [0095]-[0096], the processing errors determined from alignment errors from steps S205, S215, and S235, are used to evaluate alignment parameters

used to achieve optimum alignment in step S260), Ina does not appear to explicitly describe wherein the determination is based on at least one of the average value and standard error.

However, Matsumoto discloses determining optimal parameters based on at least one of the average value and standard error of the processing error for each processing area according to said reference processing result or said estimated processing error (paras. [0084], [0085], and [0132], the average value for each line signal is computed and only signals whose deviations from the average value fall within a range are used).

It would have been obvious to one skilled in the art at the time of the invention to have used one of the average value and standard error to determine optimal parameters as taught by Matsumoto in the method of determining alignment parameters taught by Ina since using the average value or standard error to determine optimal parameters is common since the calculation averaging or determining standard error is easily and quickly performed, thereby improving throughput by reducing processing time.

12. Claims 9, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ina in view of Suzuki et al. (US PGPub 2003/0204348, referred to as Suzuki hereinafter).

Regarding claim 9, although Ina discloses a seventh step in which candidates are selected (Fig. 2 and para. [0096], in step 255 the host determines the correlation

between AGA measurement and alignment results obtained by estimation and the alignment inspection results to compare parameter values), Ina does not appear to explicitly disclose wherein the selecting is based on residual error components of said comparative computation result.

However, Suzuki discloses selecting candidates based on residual error components of comparative computation results (para. [0125], residual error is used as a criterion for selection of optimized parameter values).

It would have been obvious to one skilled in the art at the time of the invention to have used residual error components for candidate selection as taught by Suzuki in the method of determining alignment parameters taught by Ina since using residual error components for candidate selection is common since the calculation is can be quickly determined, providing increased throughput with accuracy in candidate selection.

Regarding claim 15, although Ina discloses wherein said apparatus for determining alignment parameters determines said alignment parameters based on comparative computation results (Fig. 2 and para. [0096], in step 255 the host determines the correlation between AGA measurement and alignment results obtained by estimation and the alignment inspection results to compare parameter values), Ina does not appear to explicitly describe wherein said alignment parameters are determined based on random residual error components.

However, Suzuki discloses wherein said alignment parameters are determined based on random residual error components (para. [0125], residual error is used as a criterion for selection of optimized parameter values).

It would have been obvious to one skilled in the art at the time of the invention to have used residual error components for candidate selection as taught by Suzuki in the method of determining alignment parameters in the exposure apparatus taught by Ina since using residual error components for candidate selection is common since the calculation is can be quickly determined, providing increased throughput with accuracy in candidate selection.

Regarding claim 16, although Ina discloses excluding said device production substrate from the substrates for transfer of said device patterns by exposure or makes said comparative computation result fetching means change said alignment parameters for said position measurement and statistical processing when an error exceeds a predetermined allowable range (Fig. 2, in step S255, if errors exceed a reference threshold, parameter values or are revised to achieve optimum alignment), Ina does not appear to explicitly describe wherein the error is computed as a random residual error component.

However, Suzuki discloses wherein a random residual error component is determined (para. [0125], residual error is used as a criterion for selection of optimized parameter values).

It would have been obvious to one skilled in the art at the time of the invention to have used residual error components as taught by Suzuki as the error computed and determined whether the error exceeds a predetermined allowable range in the method of determining alignment parameters in the exposure apparatus taught by Ina since using residual error components for candidate selection is common since the calculation

is can be quickly determined, providing increased throughput with accuracy in candidate selection.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Matsumoto (US PGPub 2004/0257573) discloses calculating residuals for east shot in AGA alignment.

Matsumoto et al. (US PGPub 2003/0202182) discloses a system of determining whether AGA measurement job variables are optimum and changing the variable for subsequent lots if the variable must be changed.

Oishi et al. (US PGPub 2003/0204282) discloses predicting inspection results using a different parameter value and comparing the results.

Tolsma et al. (US PGPub 2005/0254030) discloses the selection of alignment marks based on knowledge of optimal locations dependent upon selection criteria.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Riddle whose telephone number is (571)270-7538. The examiner can normally be reached on Monday- Thursday 7:00-17:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on (571)272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. R./
Examiner, Art Unit 2851

/Diane I Lee/
Supervisory Patent Examiner, Art Unit 2851